Multicultural co-existence and e-learning:

Any place for creativity and self-organization?

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Abstract

We investigate in this paper the nature of learning processes involving creativity in the context of the e-learning paradigm. Focusing on the concept of situated cognition and on the basic premises of the Self-Organization Theory we are going to inquire about the following questions: Is it possible to develop creative thinking through e-learning and distance education? Can multi-cultural relations constitute barriers for creative learning? We will start by assuming the common sense notion of culture, understood as forms of collective habits that shape thoughts and actions on the basis of attitudes, values, modes of perception and beliefs carried by individuals. Taking this notion into consideration, we characterize creative thinking as a self-organizing process of expansion of well-structured, culturally dependent, sets of habits that are worthy of collective attention and evaluation. We assume that in e-learning, this process involves internal and external context. The first can be characterized as the e-learner's set of beliefs, motivations, values, forms of perception and skills that are relevant to her/his process of thought creation and expansion. External context, in turn, constitutes the physical and social environment where the e- learning takes place. It is conceived, in general, as the organizational perspective on the learning/training process, which involves learning equipments, values and support presented to the individual's learning processes by his or her social environment.

We suggest that cultural differences in the internal context may actually contribute to the process of creative learning, whereas cultural differences in the external context may form a significant barrier to creative learning. Given the great variety of background of positive and negative motivations (involving collective, self-organizing, interactions, language problems, and all sorts of material, technical and informational difficulties), creative thinking may face serious difficulties in e-learning communities.

Keywords: beliefs, creativity, e-learning, embedded embodied cognition, habits, internal and external contexts, order parameters, self-organization.

Introduction

There is an historical conflict between the development of philosophical, theoretical, and technical, practical knowledge. As the Brazilian philosopher Adrioli (2002) reminds us, since Plato and Aristotle there has been an overvaluation of intellectual activities to the detriment of practical activities. The first was supposed to be realized by brilliant individuals- who can anticipate, by virtue of intelligent reflection, problems and their solutions - while practical, technical knowledge would be done by slaves and less intelligent creatures whose actions result mainly from brute, bodily effort.

Nowadays, a critical attitude towards the technical mentality still seems to be the standard position of philosophers who fear that the spreading of technical activities may reduce the human creative potential to a purely mechanical process, diminishing the meaningfulness of our patterns of behavior that lie at the center of our culture and existence.

Aiming at surpassing this historical dichotomy between philosophical and technical knowledge, we propose to investigate the role of technology (understood as the set of principles that are involved in the development of tools and techniques characteristic of a culture) in learning processes involving creativity in the context of the e-learning paradigm.

Although our aim here is to be critical, we will try to be constructive instead of condemnatory. As a starting point, we will assume that, ideally, the whole purpose of technology is to improve (in a wide sense of the word) the realization of anything that is meaningful to human beings, helping with survival and the improvement of the quality of life, freeing us from unnecessary activities. In order to understand the possible role of e-learning technologies in the realization of this goal, we will investigate the relation between technology and creative learning in the following three steps:

1— A brief characterization of creativity is given in relation to a discussion of the internal and external contexts in learning situations, illustrated by some general characterizations of Brazilian and Dutch cultures.
2— The main premises of the self-organization paradigm (SOP) will be introduced in order to illustrate the dynamics of creative learning in Brazilian communities. This kind of learning is described as a particular form of activity of dynamic, gregarious, self-organizing groups;
3— Finally, problems with a standard multicultural e-learning situation are presented in relation to cultural differences and we shall make suggestions

for the organization of external contexts of e-learning, that might help to further social aspects of creative learning, on the basis of self-organization.

Through (1), (2) and (3) we aim to provide a critical analysis of the potential gains and losses of e-learning across cultural barriers.

1- Creativity and its relation to internal and external context

In 'What Is Creativity?', Margaret Boden defines creativity in terms of exploration and transformation of conceptual spaces. These are, as she stresses, multidimensional structures organized in accordance with principles that unify a domain of thinking. Such principles constitute "... the generative system that underlies that domain and defines a certain range of possibilities..." Explorations in different domains of thinking often lead to the expansion of and, sometimes, to useful transformations in, the structure of a conceptual space, providing the basis for novelties.

An important contribution to the study of creativity is given by Boden's analysis of how exploration in conceptual spaces may lead to relevant novelties in the domain of music, visual arts, literature and science. In science, for instance, she investigates Mendeleyev's creative process with the proposal of the periodic table in the 1860s: initially he classified chemical elements in rows and columns according to their similar observable properties and behaviour. In his processes of classification he left some gaps, predicting that in the future new appropriate elements could be discovered to fill them. Several years latter such elements were discovered whose properties satisfied his predictions and, moreover his table led to a more powerful classification of elements in terms of atomic number. This, in turn, explained the gaps originally left by Mendeleyev in his original classification.

Examples like the above illustrate situations in which mapping and explorations in conceptual spaces may lead to the expansion and generation of new ideas. Sometimes changes in conceptual spaces may lead to radical transformations, and not just expansions, in the constraints that define them.

In summary, the essential contribution given by Boden to the understanding of the origins of new ideas consists of making clear that conceptual exploration leading to the expansion or sometimes to the negation of their generative structure can be seen as a form of creativity. In this context, she suggests two senses in which creativity should be described. The first focuses on ideas that characterise a creative individual mind in its uniqueness:

"A valuable idea is P-creative if the person in whose mind it arises could not have had it before; it does not matter how many times other people have already had the same idea." (Boden, 1996)

It is important to realize here that P-creativity amounts to more than merely the use of a newly learned concept. It actually requires the transformation of a conceptual space by the student self. In contrast to the individual nature of P-creativity, the second sense of creativity stresses its historical characteristics:

"A valuable idea is ***H-creative*** if it is P-creative and no one else, in all human history, has ever had it before" (Boden, 1996).

The proper analysis of H-creative ideas requires investigations of ***cultural networks*** of thoughts in relation to which such ideas should be considered as creative ones. As Schaffer (1996, p.16) stresses, recent investigations on creativity and discovery "starts to look less individual and specific, and more like a lengthy process of hard work and negotiation within a set of complex social networks".

Relating creativity to education, we suggest that one of the main purposes of education is to prepare students to develop their knowledge of the world through a process of production of P-creative ideas. In other words, ideally, we would like to provide tools for students to be P-creative during their learning activities. Acknowledging the role played by ***cultural values*** in the classification of ideas as creative or not (given that worthless new ideas are not considered creative), we propose to investigate the interaction between internal and external contexts related to the development of e-learning across cultural barriers.

Considering situations involving e-learning, we focus on the complex interaction between internal and external context. ***Internal context*** can be characterized as the e-learner's set of beliefs, motivations, values, forms of perception and skills that are relevant to her/his process of thought creation and expansion. It is in the domain of internal context that the expansion of conceptual space is supposed to occur whenever the student is faced with a problem in relation to which she/he is sufficiently motivated to look for solutions.

External context, in turn, can be taken to constitute the physical and social environment where the e-learning takes place. It can be conceived as the organizational perspective on the learning/training process, which involves learning equipments, values and support presented to the individual's learning processes by his or her social environment. It is mainly through the external context that students receive some feedback concerning their progress in the expansion of their conceptual spaces.

Traditionally one may presuppose a dichotomy between internal and external context, assuming a clear separation between the psychological and the physicals and social aspects of learning. However, we suggest that it is the ***interaction*** between internal and external context that needs to be taken into account in order to understand the development of P-creative learning. Admitting that the creation of

new ideas presupposes the overcoming of limitations in the student's internal context, and that the ascription of creativity always involves reference to external context, how should this relation between internal and external context be understood? Would cultural influences constitute barriers to creativity in the multicultural, e-learning environment? We are going to consider these questions from the perspective of self-organization theory in section 2. For the moment, we would like to examine more closely the nature of internal and external contexts in relation to learning situations.

1.1 - Internal versus external context

Philips (2002) in a provocative paper entitled '*Why e-learning fails*' makes some interesting distinctions that will form part of the backbone of this talk. Of specific interest is the distinction between internal and external context, referring to the psychological and environmental aspects of learning, respectively. The internal context is sometimes referred to as the learner level, and the external context as the organizational level that structures the learning processes from outside. Concerning internal context, Philips (2002) provides us with the following list of problems:

- Low motivation for learning
- Lack of time
- Low interest in subject matter
- Poor self-study skills
- Poor time management skills
- Disrupting life events (divorce, shift change, parental duties)
- Lack of necessary e-skills (downloading files, subscribing to e-mail lists)
- Psychological resistance to losing face-to-face learning perks (benefits such as social networking, travel, snacks)

Of course many of these problems have existed throughout time and they are unavoidable in any learning situation. From the perspective of the theory of self-organization, the points mentioned in this list (motivation, self-study skills, time management skills, life-disruptions, fear of isolation, etc.) can be viewed as constraints, that act as ***control parameters*** as we will explain in section 2, that help to shape the emergence of P-creative e-learning. Specifically the fear of isolation deserves attention from the e-learning community, because it emphasises the importance of social and bodily presence in relation to learning. Although one may argue that the possibilities for electronic interaction (email, for instance) actually enhance the creation and maintenance of social networks, we take the word 'social' here to refer especially to the direct, bodily presence in a space with others, which is of considerable importance to human cognition. When Philips is talking about face-to-face contact, we take her to mean that the two 'faces' have to be physically, as

opposed to virtually, present. We will indicate below that there is a very significant sense in which e-learning technology might have a negative effect in relation to social, body-based, aspects of learning.

In relation to external context, Philips (2002) suggests the following list of problems:

- Poor internal marketing of courses and events
- Lack of clear reward structure
- Failure to provide quality-learning environment
- Failure to provide quality-learning equipment
- Failure to provide managerial feedback and support of learning
- Failure to provide time on-the-job to train
- Corporate-wide lack of dedication to a learning culture
- Blanket mandate of e-learning as the new-new thing; removal of all other methods
- Failure to match Internet training to its most appropriate purposes"

The constraints or control parameters mentioned in this list are: quality learning environment, quality learning equipment, reward structure, training opportunities, and the external generation of motivation. Here it is the 'quality-learning environment' that seems to deserve specific attention. What may count as a quality-learning environment is determined, as we will illustrate in section 1.2, to a significant extent by cultural factors. The failure to provide a quality-learning environment may be strongly related to the problem of psychological resistance to losing opportunities for direct social interaction.

As we see it, cultural differences present a challenge to e-learning because the interaction between internal and external context will be so diverse in different cultures that it may hinder a straightforward *global* application of e-learning technology. Speaking more generally, the globalization of e-learning (i.e. the neglect of cultural differences) might ignore the interaction between all the constraints mentioned above to such an extent that the emergence of P-creative ideas would be significantly impoverished.

In the next section we will look more closely at a way of depicting the influence of cultural attitudes concerning group learning processes on internal and external contexts.

1.2 - Interaction between internal and external contexts in learning situations

In order to better understand the interaction between internal and external context we developed a 3-dimensional space in which different features of this interaction can be displayed. Let us start by indicating that learning situations can

range from a minimum to a maximum of social interaction. Obviously, learning (almost) always involves more than one person and never an infinitely large group. What we call 'individual' relates to a situation in which only one person is physically present in a specific location, whereas with 'group' we refer to a situation in which more than two persons are physically present in the same location, and are actively and simultaneously occupied with the same learning process (obviously, the continuum can be extended to involve groups of people much larger than two). We can visualize a continuum between individual and group learning-activities by means of the following line:

Individual Group

Figure 1

Any specific learning situation can be displayed as a point on this line, depending on the amount of group processes that are involved in the learning process.

This continuum exists both in relation to internal and to external context. That is, people can be aiming for individualistic or group learning situations, and similarly, the environmental or organizational structure can be directed at promoting either individualistic or group learning processes. Combining these two continua, we get the following 3-dimensional space:

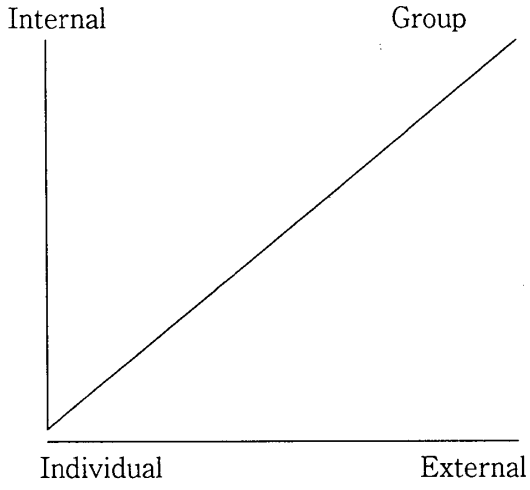

Figure 2

We suggest that culturally different preferences for individual versus group learning processes, in relation to internal and external contexts, can be displayed by means of this space.

For example, in the everyday learning situation in classrooms in Brazil, the direct interaction between students and lecturers is valued as providing a strong impetus to the development of creative thought. The presence of an inspiring

lecturer is considered to make the student active, as is the interactive presence of his/her fellow students. Learning, in Brazil, is very much an embedded, gregarious, activity, strongly involving social components. In fact, it is fair to say that creative learning is, to a large extent, due to the self-organizing interaction between students as well as between students and teachers. Both the students themselves, as well as the organizational structure of learning are directed towards enhancing this group process. Thus, the learning situation in Brazil can be displayed as follows:

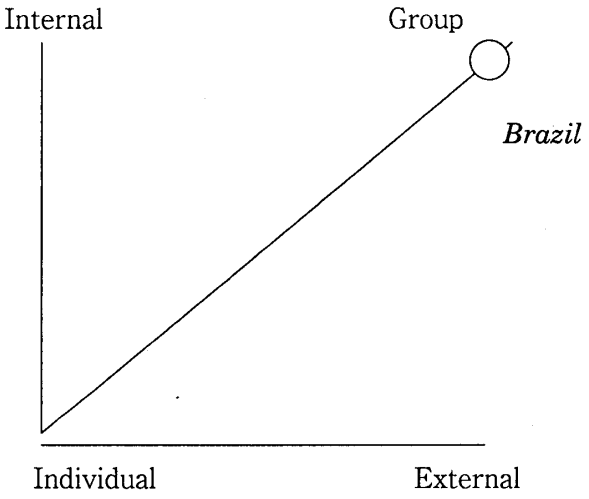

Figure 3

In contrast, the attitude towards learning in the Netherlands (which we only discuss here for the purpose of providing an illustrative difference with the Brazilian situation) is much more individualistic than in the case of Brazil. Traditionally, the Dutch culture is characterized by a strong emphasis on individual independence and personal liberty. This extends to learning situation as well. Popular 'open schools' such as the LOI (Leiden Onderwijs Instituut or Leiden Teaching Institute) offer so-called tailor-made courses, in which the student almost completely independently determines what is learned, when, and where. This learning situation is characterized by an almost complete absence of any direct personal contact with a teacher or other students. Email, message boards and chat-rooms are the sole sources for interaction in this situation. Figure 4 illustrates this Dutch situation in comparison with the Brazilian one:

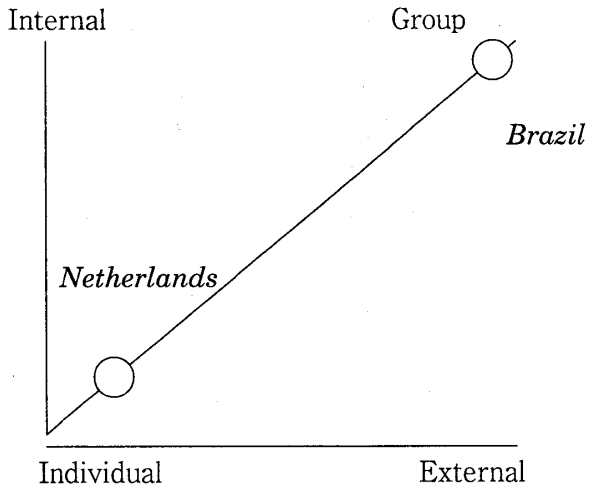

Figure 4

Similarly, at Dutch universities the amount of social interaction was limited to a large extent to classes, in which a teacher would present and explain the material to be learned and the possibilities for interaction were minimal because the amount of students involved (sometimes over 400). Recently, however, many Dutch universities realized the deficits of this approach (i.e. huge number of drop-outs and cases of study-delay) and introduced a more 'student-activating' set-up, in which more amount of time is reserved for interactive discussions, both between students and between students and the teacher. This change in external context is displayed in Figure 5:

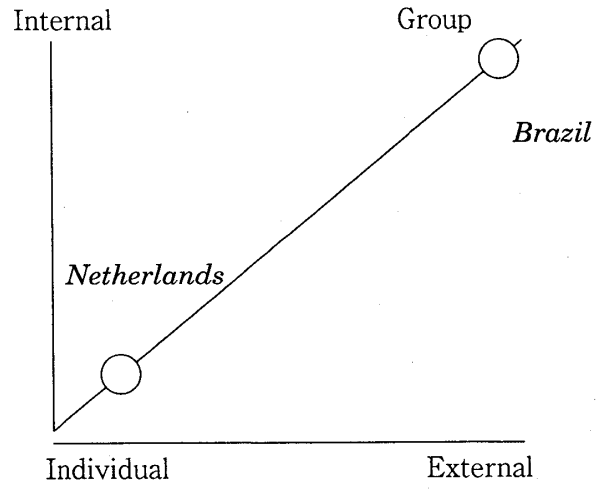

Figure 5

As is clear from the figure, a change in external context need not always be accompanied immediately by changes in the internal context. In fact, personal experiences in one Dutch university indicate that considerable effort has to be exerted in order to motivate (many, not all) students to engage more actively in group

processes. Even more telling, perhaps is that the lack of motivation of students to participate actively in group discussions led very recently to a change in the demand on students to participate in group activities (i.e. participation in group discussion sessions is no longer obligatory). Change in external context may take some time to affect change in the internal environment and vice versa. In order to understand this interaction between internal and external context we need to consider the theory of self-organization.

2 Interaction between contexts and the theory of self-organization

2.1 The theory of self-organization

A fundamental hypothesis of the Theory of Self-Organization (TSO) is that self-organization is a *process* with an intrinsic dynamics that allows for an emergent order that is caused by its own constitutive elements. The emergent order is sometimes called the order parameter. As characterised by Haken (1999), *order parameters* constitute high-level patterns that result from the interaction between low-level components. Once created, they constrain and control the behaviour of the low-level components. These, in turn, may change, in a circular feed-back way, the high-level order parameters, depending on the existing control parameters.

Control parameters can be understood as the constraints that shape the flow of the order parameter. Very often, to understand the patterns of the order parameters it is necessary to understand that they involve several control parameters resulting from the dynamics of **competition, co-operation and adjustment** established between elements and informational patterns in the environment. In relation to our topic, we can say that creative learning would qualify as the order parameter, whereas the constraints belonging to internal and external contexts, as identified by Phillips, constitute control parameters.

A second hypothesis is that there are two basic phases in a self-organization process known as *primary* and *secondary* (Debrun, 1996; Gonzalez, 2000). The primary one characterizes the origins of a process in which organic or inorganic elements initially separated (or with independent behaviors) interact amongst themselves in such a way that they become coordinated and interdependent, giving place to new structures or distinct forms of organizations.

In self-organizing processes, this primary phase occurs, ideally, without the presence of a central control or any kind of pre-established program, set of rules or laws. Chance and especially the dynamic interaction between distinct elements allow the possible emergence of new forms of organization. The resulting processes is "...self-organizing in the sense that it changes from *separated parts* to *parts joined*" (Ashby, 1962) without the pre-determination of an external command. This process sometimes allows the emergence of order parameters.

Of the several possible emergent patterns some will evolve. However, in the

primary phase of self-organizing processes there is no guarantee that any of those emergent forms of organization will become stable and evolve further. In the primary phase there is only a coming together of several independent histories of events (ideally by chance) that open the possibility of stable forms of interactions. However, the emergence of these interactions does not yet significantly shape the course of future events.

When learning and adjustment mechanisms are present in order to assist the development of established organizations, then a second phase of self-organization starts: This secondary phase characterizes the process through which the primarily self-organized system acquires the ability to create and to change *stable* habits, learning from experience. In these circumstances, chance plays a very small role in the development of the evolving organization.

Applying the TSO to the topic of creative learning, the following picture emerges: The interaction between the internal and external context constraints can be viewed as the intermingled set of control parameters that shape the order parameters that will guide creative learning processes. That is, the development of creative learning (interpreted as the flow or trajectory of the order parameter) is influenced in a self-organized way (not prescribed) by the values of the control parameters.

In what follows we will consider the case of learning situations in Brazil, in order to investigate the self-organization of creative learning in this group-activities-oriented culture. Then we will examine the possible consequences of applying e-learning technology to this situation.

2.2 Cultural differences: everyday-learning situations in Brazil

In this section we will discuss an example of a Brazilian learning situation in order to investigate possible difficulties in relation to e-learning that are specifically relevant to the topic of cultural differences and creative learning. More specifically, we shall contrast a creative learning situation in Brazil with a multicultural e-learning situation.

As mentioned, the direct interaction between students and lecturers is considered as providing a strong impetus to the development of creative thought in Brazilian communities. The presence of inspiring lecturers motivates the students, helping them to deal with difficulties of different sorts. Furthermore, we believe that creative learning is developed in Brazil mainly due to the self-organizing interaction between students and teachers..

An experience which seems worth reporting happened in Santa Terezinha do Araguaia, a Brazilian country side village, where courses were developed to teach laymen adults from different cultural backgrounds, as part of a project known as Inaja (this is the name of an extremely resistant Brazilian tree that can survive for months, in very hostile environment, without water and basic nutrients.). The cultural

heterogeneity of the students characterized one of the most intriguing features of the Inaja project. This included laymen A-level teachers (belonging, in general, to a poor working class background), indigenous people from different tribes, and posseiros (landless people who move around the country from north to south looking for a small piece of land to cultivate). A basic characteristic common to our students was the fact that all of them were involved with teaching of children and adolescents in remote areas of Brazil where there is a shortage of fully qualified lecturers.

As lecturers involved with the Inaja project, we were supposed to prepare our students to learn basic mathematics, philosophy, biology, chemistry, education and sociology during three periods of four consecutive weeks of intensive studies and practical interactions in the middle of the forest. The face-to-face interaction mingled with a set of activities that the students were supposed to develop by themselves when the lecturers were not around. At the end of three years, when successful, the students received a diploma, which allows them to teach, officially, courses at Brazilian A-level.

Given the strong heterogeneous background of our students, the first step to face the difficulties with communication consisted of a careful analysis of the environmental constraints that shaped the student's *external context* in which the teaching should occur. Such constraints involved control parameters like: (a) quality learning environment, (b) reward structures, (c) time available to train and to develop creative learning, amongst others.

Concerning the first control parameters, (a), we observed, for example, the influence of very high temperature (40 C) during afternoon, lack of electricity in the village during the evening, availability of vast amount of natural resources that could be used as auxiliary instruments for teaching, economical constraints related to accommodations, etc.

The reward structures, (b), seemed to be related to the presence of religious, local, norms concerning what could be considered relevant and important in terms of the student/teacher interaction, expectations from the directors of the project and from the students original schools, etc. The time available, (c), the time available for the students to learn and practise the main topics was extremely limited due to their other obligations outside of the class.

A careful analysis of *internal context,* which characterizes the student's mental universe, also provided information about the main set of activities that lecturers would have to face. This included the students cultural background, desires, fears, basic intellectual habits related to ways of reading, writing and formulating/answering questions, expectations about certain difficulties and developments of the course, etc. These constituted control parameters like: (a) motivation for learning, (b) self-study skills, (c) interest in the subject, amongst others.

From the several control parameters that shaped the student's internal context, motivation for learning was the most noticeable one. Students were highly motivated

and wanted to cooperate with lecturers and amongst themselves in order to have a successful course. In what concerns (b), most of them seem to lack relevant self-study skills - they were dependent on teachers to tell them what to do and how to do it. Their interest in the subject, (c), seem to vary according to the degree of abstraction involved in the subject - the more abstract a required task less interested they would be. In contrast, the more practical (and related to their everyday needs) a task, the more interested they would be.

Taking into considerations the above internal and external control parameters, we developed reading and writing activities. Furthermore, several non- verbal practices were realized, such as instructional games, through which the students were supposed to recognize and classify patterns, interact amongst themselves and exchange experiences about their main difficulties. Intense artistic activities were also realized, including dancing, singing, playing musical instruments, theatrical performances through which the students improvised rich scenes characteristic of their cultural patterns.

By the end of the course, collective debates concerning specific questions such as - what are the main elements that identify a student as belonging (or not) to a specific group? - were realized with great success despite of numerous difficulties related to the interaction between internal and external contexts. Due to the big cultural differences between the students some questions or exercises provoked such heated debates that active and stringent intervention by the teachers was required in order to continue with the teaching.

Ultimately, our students developed creative abilities, such as the disposition to face uncertainty and problematic situations with an open mind looking for solutions, preparing themselves for teaching children and adolescents to share the same attitude in adverse situations. The lecturers involved in the Inaja project also learned great amount of information about the ability do deal with uncertainties in complex external and internal contexts. Instead of considering their teaching through ready-made tools, they learned how to improvise when necessary, allowing self-organization to play a role in their teaching practises.

Taking the Brazilian example into consideration, we propose the hypothesis that ***situated, spontaneous, self-organizing interaction*** between the members of the Inaja learning communities were essential for the emergence of creative abilities acquired by the students. To conclude this paper we will explore some possible consequences of adopting such a hypothesis in the context of e-learning.

Provisory conclusions

The results obtained with the Inaja project led us to conclude that the cultural differences present in both the internal and external context, actually contributed to the process of creative learning, without the support of e-learning resources. In the

Inaja project, cultural differences did not constitute insurmountable barriers, but provided opportunities for creative learning. This conclusion reinforced the hypothesis that situated, spontaneous, self-organizing interaction between culturally diverse members of a learning community is essential for the emergence of creative abilities acquired by students.

The great diversity of external context shaping particularly the collective interaction between the students, language problems and material and technical difficulties seem to play a contrary role in creative learning when e-learning is involved. Creativity, we submit, can be negatively affected by an external e-learning context, in which more passive, isolated and less gregarious ways of interaction are forced upon students, preventing self-organization to occur.

The actual presence of the teachers in the learning situation, together with the students, allowed an intense experience of adjustment through the sharing of external context. This adjustment would be more difficult to achieve to the same extend through the use of physically separate, e-learning, interaction. In the case of e-learning, many factors of the external context could be different for teachers and students - the teacher would be in one situation and the students in an entirely different one. This difference in control parameters could lead to very different emergent effects.

Analyzing the creative learning process from the Theory of Self-Organization, it becomes clear that internal and external factors are not just small circumstantial variations. They are, on the contrary, extremely important control parameters that shape the learning process. Since cultural differences show themselves through the internal and external context, this suggests that a global e-learning approach (i.e. using the same e-learning courses world wide) is unlikely to succeed completely.

Ignoring the importance of the physical and bodily aspects of the learning environment, by creating a general culture independent learning format, would amount to the same neglect of the practical aspects of knowledge and learning that was so characteristic of the Greek philosophers. Overcoming the dichotomy between philosophical and technical knowledge implies, in this context, that the actual physical and cultural details are taken as essential to creative learning.

We suggest that, in order to stimulate creative thinking, e-learning communities should further investigate the dynamic, self-organizing, interaction between internal and external context of learning.

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